Remarks

The Office Action dated November 22, 2006 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-42 are pending in this application. Claims 1-42 stand rejected.

The rejection of Claims 1-42 under 35 U.S.C. § 102(b) as being anticipated by Matsuo et al. (US 5,115,077) is respectfully traversed.

Matsuo et al. describe polyetheric copolymers, a process for preparing the polyetheric copolymers, and some example products formed using the polyetheric copolymers. Cols. 35 and 36 describe using poletheric copolymer fibers to make heat-resistant and fire-retardant paper, Cols. 36-39 describe molding the polyetheric copolymer into an amorphous film, Cols. 39-41 describe making polyetheric copolymer pipes, some with reinforcing fibers, and Cols. 59-63 describe printed circuit boards formed from the polyetheric copolymers.

Independent Claim 1 of the present application recites Independent Claim 1 of the present application recites "[a] composite sheet material comprising: at least one porous core layer comprising at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of said porous core layer, said porous core layer having a void content of about 5 percent to about 95 percent; and at least one skin, each said skin covering at least a portion of a surface of said at least one porous core layer, said skin comprising at least one of a thermoplastic film, an elastomeric film, a thermosetting coating, an inorganic coating, a fiber based scrim, a non-woven fabric, and a woven fabric, said skin having a limiting oxygen index greater than about 22, as measured per ISO 4589."

Matsuo et al. do not describe nor suggest a composite sheet material as recited in Claim 1. Particularly, Matsuo et al. do not describe nor suggest a composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the porous core layer where the porous core layer has a void content of about 5 percent to about 95 percent. Also, Matsuo et al. do not describe nor suggest at least one skin covering at least a portion of a surface of the one porous core layer, with the skin including at least one of a thermoplastic film, an elastomeric film, a thermosetting coating, an inorganic coating, a fiber based scrim, a non-woven fabric, and a woven fabric, and with the skin having a limiting oxygen index greater than about 22, as measured per ISO 4589. Rather Matsuo et al. describe a fiber reinforced pipe that is not porous, does not include a void content of about 5% to about 95%, and does not include at least one skin covering a surface of the pipe. One skilled in the art would understand that a plastic pipe cannot be porous with a void content of the pipe wall of about 5% to 95% or else the pipe would leak the fluid it was intended to flow through the pipe. Matsuo et al. also describe in Example 69 a three layer composite formed by sandwiching a mat of continuous glass fibers between two sheets of polyetheric copolymer and then laminating the three layer composite together under heat and pressure. There is no description or suggestion that the three layer composite is porous having a void content of about 5% to about 95%. Applicants submit that the heat and pressure of the laminating process would fill any voids in the mat of continuous fibers. Further, because, Col. 61 describes that the following examples, which includes Example 69, are directed to examples relating to the printed circuit boards of feature

(20). One skilled in the art knows that printed circuit boards are not porous because a porous circuit board would not be a good insulator which is a required property of a circuit board.

Furthermore, the Office Action, at page 5, suggests that the process for blending or kneading the polyetheric copolymer with the filler is describe in feature (17). While Cols. 52-54 describe blending reinforcing fibers and fillers into the polyetheric copolymer with, for example a twin screw extruder, Applicants submit that the resultant molded product would not be porous having a void content of about 5% to about 95%. Applicants submit that there are no teachings by Matsuo et al. of a porous product having a void content of about 5% to about 95%. Accordingly, Applicants submit that independent Claim 1 is patentable over Matsuo et al.

Claims 2-12 and 40 depend from independent Claim 1. When the recitations of dependent Claims 2-12 and 40 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 2-12 and 40 likewise are patentable over Matsuo et al.

Independent Claim 13 of the present application recites "[a] method of manufacturing a porous fiber-reinforced thermoplastic sheet, said method comprising: providing a porous fiber-reinforced thermoplastic sheet comprising at least one porous core layer comprising a thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers, each porous core layer having a void content of about 5 percent to about 95 percent; and laminating at least one skin to a surface of the porous fiber-reinforced thermoplastic sheet, each skin comprising at least one of a thermoplastic film, an elastomeric film, a thermosetting coating, an inorganic coating, a fiber based scrim, a non-woven fabric, and a woven fabric, the skin having a limiting oxygen index greater than about 22, as measured per ISO 4589 to enhance at

least one of the flame, smoke, heat release and gaseous emissions characteristics of the porous fiber-reinforced thermoplastic sheet."

Matsuo et al. do not describe nor suggest method of manufacturing a porous fiber-reinforced thermoplastic sheet as recited in Claim 13. Particularly, and as explained above, Matsuo et al. do not describe nor suggest at least one porous core layer that includes a thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers, with each porous core layer having a void content of about 5 percent to about 95 percent. Rather, Matsuo et al. describe a fiber reinforced pipe that is not porous, does not include a void content of about 5% to about 95%, and does not include at least one skin covering a surface of the pipe. One skilled in the art would understand that a plastic pipe cannot be porous with a void content of the pipe wall of about 5% to 95% or else the pipe would leak the fluid it was intended to flow through the pipe. Matsuo et al. also describe in Example 69 a three layer composite formed by sandwiching a mat of continuous glass fibers between two sheets of polyetheric copolymer and then laminating the three layer composite together under heat and pressure. There is no description or suggestion that the three layer composite is porous having a void content of about 5% to about 95%. Applicants submit that the heat and pressure of the laminating process would fill any voids in the mat of continuous fibers. Further, because, Col. 61 describes that the following examples, which includes Example 69, are directed to examples relating to the printed circuit boards of feature (20). One skilled in the art knows that printed circuit boards are not porous because a porous circuit board would not be a good insulator which is a required property of a circuit board.

Furthermore, the Office Action, at page 5, suggests that the process for blending or kneading the polyetheric copolymer with the filler is describe in feature (17). While Cols. 52-54 describe blending reinforcing fibers and fillers into the polyetheric copolymer with, for example a twin screw extruder, Applicants submit that the resultant molded product would not be porous having a void content of about 5% to about 95%. Applicants submit that there are no teachings by Matsuo et al. of a porous product having a void content of about 5% to about 95%. Accordingly, Applicants submit that independent Claim 13 is patentable over Matsuo et al.

Claims 14-23 and 41 depend from independent Claim 13. When the recitations of dependent Claims 14-23 and 41 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 14-23 and 41 likewise are patentable over Matsuo et al.

Independent Claim 24 of the present application recites "[a] composite sheet material comprising: a permeable core comprising discontinuous reinforcing fibers bonded together with a thermoplastic resin, said permeable core having a density from about 0.2 gm/cc to about 1.8 gm/cc, and a void content of about 5 percent to about 95 percent, said permeable core including a surface region; and an adherent layer adjacent to said surface region, said adherent layer comprising a material having a limiting oxygen index greater than about 22, as measured per ISO 4589."

Matsuo et al. do not describe nor suggest a composite sheet material as recited in Claim 24. Particularly, Matsuo et al. do not describe nor suggest a composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the

porous core layer where the porous core layer has a void content of about 5 percent to about 95 percent. Rather Matsuo et al. describe a fiber reinforced pipe that is not porous, does not include a void content of about 5% to about 95%, and does not include at least one skin covering a surface of the pipe. One skilled in the art would understand that a plastic pipe cannot be porous with a void content of the pipe wall of about 5% to 95% or else the pipe would leak the fluid it was intended to flow through the pipe. Matsuo et al. also describe in Example 69 a three layer composite formed by sandwiching a mat of continuous glass fibers between two sheets of polyetheric copolymer and then laminating the three layer composite together under heat and pressure. There is no description or suggestion that the three layer composite is porous having a void content of about 5% to about 95%. Applicants submit that the heat and pressure of the laminating process would fill any voids in the mat of continuous fibers. Further, because, Col. 61 describes that the following examples, which includes Example 69, are directed to examples relating to the printed circuit boards of feature (20). One skilled in the art knows that printed circuit boards are not porous because a porous circuit board would not be a good insulator which is a required property of a circuit board.

Furthermore, the Office Action, at page 5, suggests that the process for blending or kneading the polyetheric copolymer with the filler is describe in feature (17). While Cols. 52-54 describe blending reinforcing fibers and fillers into the polyetheric copolymer with, for example a twin screw extruder, Applicants submit that the resultant molded product would not be porous having a void content of about 5% to about 95%. Applicants submit that there are no teachings by Matsuo et al. of a porous product having a void content of about 5% to about 95%. Accordingly, Applicants submit that independent Claim 24 is patentable over Matsuo et al.

Claims 25-39 and 42 depend from independent Claim 24. When the recitations of dependent Claims 25-39 and 42 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 25-39 and 42 likewise are patentable over Matsuo et al.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1-42 be withdrawn.

The rejection of Claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Matsuo et al. (US 5,115,077) in view of Matsunaga et al. (JP 02-84565) or Lindenfelser (US 6,565,712) or Matsuda et al. (US 5,316,834) is respectfully traversed.

At least for the reasons explained above, Matsuo et al. do not describe nor suggest a composite sheet material as recited in Claim 1.

Matsunaga et al. is cited for teaching fiber based scrims such as polyacrylonitrile. However, Matsunaga et al. do not describe nor suggest a scrim. Rather, Matsunaga et al. describe "fiber, such as polyester based, polyamid-based, polyacrylonitrile-based or poyurethane-based fiber, containing a specific amount of cellulosic ultrafine powder adhered to the surface thereof and excellent in both of the moisture absorbing and releasing properties". Matsunaga et al. is not cited for and does not teach a composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the porous core layer where the porous core layer has a void content of about 5 percent to about 95 percent. As explained above, Matsuo et al. do not describe nor suggest such a structure.

Lindenfelser is cited for teaching a composite doctor blade that includes an inner layer of a thermoplastic resin filled with heat resistant, non-glass, long-strand fibers (carbon fibers or aramid fibers), one or more intermediate layers of carbon fibers, and one or more layers of surface sheeting. Lindenfelser is not cited for and does not teach a composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the porous core layer where the porous core layer has a void content of about 5 percent to about 95 percent. As explained above, Matsuo et al. do not describe nor suggest such a structure.

Matsuda et al. is cited for teaching a fiber reinforced thermoplastic sheet that includes a polyphenylene sulfide resin reinforced with a carbon or glass fiber. Matsuda et al. is not cited for and does not teach a composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the porous core layer where the porous core layer has a void content of about 5 percent to about 95 percent. Rather, Matsuda et al. describes a sheet having no voids. As explained above, Matsuo et al. do not describe nor suggest such a structure.

Matsuo et al. in combination with Matsunaga et al. or Lindenfelser or Matsuda et al. do not describe nor suggest composite sheet material as recited in Claim 1. Particularly, Matsuo et al. in combination with Matsunaga et al. or Lindenfelser or Matsuda et al. do not describe nor suggest composite sheet material that includes a porous core layer that includes at least one thermoplastic material and from about 20 weight percent to about 80 weight percent reinforcing fibers based on a total weight of the porous core layer where the porous core layer has a void

content of about 5 percent to about 95 percent. Therefore, modifying Matsuo et al. with the teachings of Matsunaga et al. or Lindenfelser or Matsuda et al. do not teach or suggest all the limitations of Claim 1. Accordingly, Applicants submit that independent Claim 1 is patentable over Matsuo et al. in combination with Matsunaga et al. or Lindenfelser or Matsuda et al.

Claim 4 depends from independent Claim 1. When the recitations of dependent Claim 4 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claim 4 likewise is patentable over Matsuo et al. in combination with Matsunaga et al. or Lindenfelser or Matsuda et al.

For the reasons set forth above, Applicants respectfully request that the Section 103(a) rejection of Claim 4 be withdrawn.

The rejection of Claims 1-42 under 35 U.S.C. § 103(a) as being unpatentable over Matsuo et al. (US 5,115,077) is respectfully traversed.

At least for the reasons explained above, Matsuo et al. do not describe nor suggest a composite sheet material as recited in Claim 1, or a porous fiber reinforced thermoplastic sheet as recited in Claim 13, or a permeable core as recited in Claim 24. Accordingly, Applicants submit that independent Claims 1, 13, and 24 are patentable over Matsuo et al.

Claims 2-12 and 40 depend from independent Claim 1, Claims 14-23 and 41 depend from independent Claim 13, and Claims 25-39 and 42 depend from independent Claim 24. When the recitations of Claims 2-12 and 40, Claims 14-23 and 41, and Claims 25-39 and 42 are considered in combination with the recitations of Claims 1, 13, and 24 respectively, Applicants respectfully submit that dependent Claims 2-12, 14-23, 25-39, and 40-42 likewise are patentable over Matsuo et al.

For the reasons set forth above, Applicants respectfully request that the Section 103(a) rejection of Claims 1-42 be withdrawn.

The rejection of Claims 1-42 under the judicially created doctrine of obvious-type double patenting as being unpatentable over Claims 1-4, 26-27, and 29-42 of co-pending Application No. 10/696,869 (US 2005/0095415) is respectfully traversed.

Applicants respectfully submit that Claims 1-42 of the present application are patentably distinct from the claims of the co-pending application. Particularly, independent Claim 1 of the co-pending application recites a layer comprised of a polymerizable component comprised of chemically reactive components. There is no such recitation in the claims of the present application. Applicants submit that one skilled in the art would understand that the thermoplastic material that is a component of the core layer recited in the claims of the present application is polymerized and contains no polymerizable, chemically reactive components.

Further, independent Claim 1 of the present application recites a porous core layer comprising at least one thermoplastic material and reinforcing fibers and having a void content of about 5 percent to about 95 percent, independent Claim 13 recites providing a porous fiber reinforced thermoplastic sheet comprising a porous core layer comprising a thermoplastic material and reinforcing fibers and having a void content of about 5 percent to about 95 percent, and independent Claim 24 recites a permeable core comprising discontinuous fibers bonded together with a thermoplastic resin and having a void content of about 5 percent to about 95 percent. Applicants respectfully submit that the claims of the co-pending application do not include such limitations. Particularly, there is nothing in the claims to indicate or suggest that after the polymerization of the polymerizable components that the resultant composite is porous.

Specifically, there is nothing in the claims to indicate or suggest that after the polymerization of the polymerizable components that the resultant composite has a void content of about 5 percent to about 95 percent.

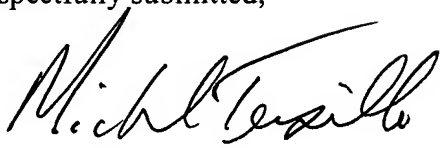
Still further, independent Claim 1 recites at least one skin covering a portion of the core layer where the skin has a limiting oxygen index greater than about 22, independent Claim 13 recites laminating at least one skin on a surface of the porous fiber reinforced thermoplastic sheet with each skin having a limiting oxygen index greater than about 22, and independent Claim 24 recites an adherent layer adjacent to the surface region where the adherent layer comprises a material having a limiting oxygen index greater than about 22. Applicants respectfully submit that the claims of the co-pending application do not include or suggest such limitations. Particularly, the claims of the co-pending application do not include a recitation that includes a skin having a limiting oxygen index greater than about 22 covering a porous core layer comprising a thermoplastic material and reinforcing fibers.

Moreover, Claims 1-4, 26-27, and 29-42 of the co-pending U.S. Patent Application have not issued in a U.S. Patent. For at least the reasons given above, Applicants respectfully request that the provisional double patenting rejection of Claim 1-42 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Favorable action is respectfully

solicited.

Respectfully submitted,



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